

RIFFLE BEETLES IN THE GENUS *STENELMIS* (COLEOPTERA: ELMIDAE) FROM WARM SPRINGS IN SOUTHERN NEVADA: NEW SPECIES, NEW STATUS, AND A KEY¹

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ABSTRACT: *Stenelmis lariversi* sp. nov. is described from Ash Springs, Lincoln Co., Nevada, where it is apparently endemic. *Stenelmis moapa* is elevated to a species, separate from *Stenelmis calida*. Both species are endemic to southern Nevada. *Stenelmis calida* and *S. moapa* are closely related, but *S. lariversi* is more closely related to the widespread *S. occidentalis*, the only other species known from warm springs in southern Nevada.

I revised the North American species of the riffle beetle genus *Stenelmis* (Schmude 1992) as part of my doctoral dissertation, published descriptions of three new species (Schmude and Brown 1991, Schmude et al. 1992), and clarified the status of three others (Schmude and Hilsenhoff 1991). Recent studies of the benthic fauna in warm springs in southern Nevada have dealt, in part, with species of *Stenelmis* (W.D. Shepard, in litt.), but their taxonomic status needs to be updated so that valid names can be used. Thus, I describe in this paper one new species, elevate one previously described subspecies to specific level, and present a key to the species in the genus that occur in southern Nevada. Although I intend to publish a North American revision of *Stenelmis* as soon as possible, I wish to accommodate colleagues studying this group in Nevada by making the names available in a timely fashion.

Materials and methods, including abbreviations used for pronotal and elytral characters, are the same as those in Schmude and Brown (1991) and Schmude et al. (1992). A Wild M 400 Photomakroskop with Kodak TMAX 100 film at 25X magnification was used to obtain the habitus pictures (Figs. 1-3). The following institutions and individuals provided specimens for this study, while others are repositories: AMNH-American Museum of Natural History, New York, L.H. Herman; CASC-California Academy of Sciences, San Francisco, D.H. Kavanaugh, R. Brett; CNCI-Canadian National Collections, Ottawa; INHS-Illinois Natural History Survey, Champaign, K.C. McGiffen, K.R. Methven; LACM-Natural History Museum of Los Angeles County, Los Angeles, R.R. Snelling; LSUC-Louisiana State Univ., Baton Rouge, J.B. Chapin, C.B. Barr; MCZC-Museum of Comparative Zoology, Harvard Univ., Cambridge, S.R. Shaw, S. Pratt, D. Furth; NMNH-National Museum of Natural History, Smithsonian Institution, P.J. Spangler;

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NSDA-Nevada State Dept. of Agriculture, Reno, R.C. Bechtel; SEMC-Snow Entomological Museum, Univ. of Kansas, Lawrence, G.W. Byers, R.W. Brooks, J. Pakaluk, J.K. Gelhaus; UCRC-Univ. of California, Riverside, S.E. Frommer; UWIC-Univ. of Wisconsin, Madison; WSUC-Washington State Univ., Pullman, R.S. Zack; CBB-Cheryl B. Barr, Univ. of California, Berkeley; HPB-Harley P. Brown, Oklahoma Museum of Natural History, Norman; KLS-Kurt L. Schmude; WDS-William D. Shepard, California State Univ., Sacramento.

Stenelmis lariversi Schmude, NEW SPECIES

HOLOTYPE MALE. **Head:** Interocular width (IOW) 0.35 mm; dark medial stripe between eyes very narrow and short; light lateral stripes cover most of the area between the eyes and broadly connect posteriorly. Antennae and palpi testaceous.

Pronotum (Fig. 1): Pronotal length (PL) 0.93 mm, pronotal width (PW) 0.80 mm. Widest near midlength. Lateral margins sinuate basally, bisinuate apically; anterolateral angles narrow, deflexed, and divergent. Median sulcus (MS) shallow, narrow, and uniform in width. Median costae (MC) low and broad, more raised and mound-like posteriorly. MS and MC obsolete anterior 0.32 and posterior 0.07. Oblique lateral depression (OLD) moderate in depth. Lateral tubercles moderately prominent; posterior tubercle (PT) only slightly elongate. Area between anterior tubercle and anterolateral angles moderately raised and mound-like. Pronotal granules (PG) evenly scattered, not numerous, very small (as large as femoral granules), and difficult to discern anteriorly. Color dull gray-brown. Surface very pubescent, velvety in appearance.

Elytra (Fig. 1): Elytral length (EL) 1.95 mm, elytral width (EW) 0.96 mm. Background color brown; elytra immaculate. Discal costae 0.22 elytral length, low posteriorly, moderately raised and convergent anteriorly, reaching basal margin. Lateral carina indistinct, with only a low costa on interval 6. Surface very tomentose, but less so than pronotum. Punctures of elytral striae difficult to see amid tomentum. Scutellar granules not discernible.

Venter: Apical emargination of last sternum slightly wider than apical width of tarsomere 5.

Legs: Femoral granules (FG) sparse, small, and of one size. Femora and tibiae pale gray; apices of femora, bases of tibiae, and tarsi testaceous. Mesotibial ridge low and elongate, located in distal half of segment; no metatibial ridge. Tarsomere 5 equal to or shorter than combined lengths of preceding four tarsomeres, and distinctly dilated in the apical half (not gradually widened from base to apex); tarsal claws short, narrow, and only slightly curved.

Genitalia (Fig. 4): Penis widest at base, progressively narrowed to middle where it is slightly bulbous for a short distance, gradually narrowed to its rounded apex. Parameres with inner dorsal margins slightly divergent, apices pointed and nearly at a 90 angle; outer margins subparallel basally, slightly sinuate and convergent apically; inner ventral margins slightly sinuate apically.

ALLOTYPE. IOW: 0.38 mm, PL: 0.96 mm, PW: 0.84 mm, EL: 2.00 mm, EW: 0.96 mm. Nearly identical to holotype. Pronotal MS and MC obsolete in anterior 0.39.

TYPE DATA. Holotype, allotype, and 110 paratypes: "NEVADA: Lincoln Co. Ash Springs, Hwy 93 30 May 1991 Coll'rs: C.B. Barr & W.D. Shepard"/ "Collected in Ash Springs, within warm springheads"/(red) "HOLOTYPE (or ALLOTYPE) STENELMIS LARIVERSI Schmude Det: K.L. Schmude"/(male genitalia in microvial). Holotype, allotype, and 12 paratypes are in the CASC. Paratypes are in the following collections: 12 NMNH, 8 INHS, 8 SEMC, 6 AMNH, 6 LSUC, 6 Monte L. Bean Museum, Brigham Young Univ., 2 CNCI, 2 UWIC, 14 CBB, 12 HPB, 9 KLS, 13 WDS. Nine additional paratypes (6 AMNH; 3 KLS) have the following label data: "Nev.; Lincoln Co. Ash Sprg.; warm May 4, 1973 Joe Schuh, Coll.". Twenty-two more paratypes (16 WSUC; 6 KLS) have the following label data: "NV: Lincoln Co., Ash Springs, Ash Spring 26 March 1992



Figs. 1-3. 1. *Stenelmis lariversi*, n. sp., paratype. 2. *S. moapa* La Rivers, paratype. 3. *S. calida* Chandler, paratype.

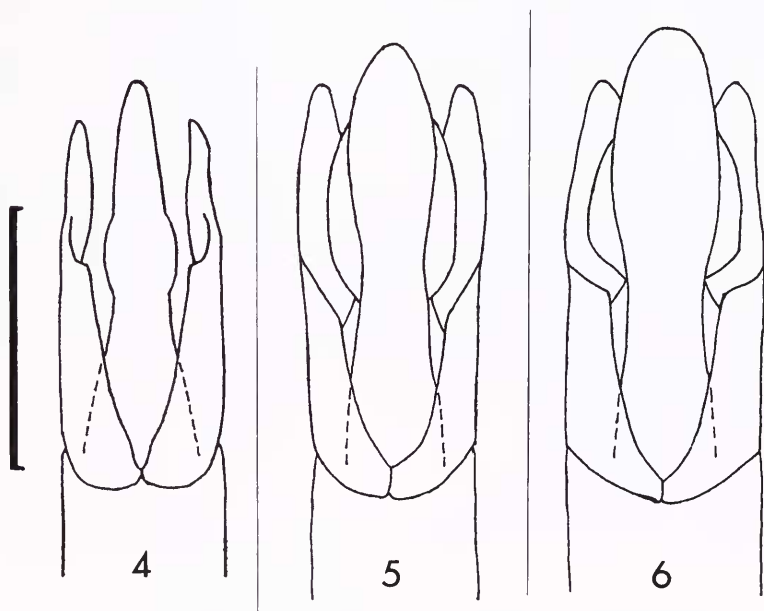
R.S. Zack & K.A. Rosema collectors". Three damaged specimens not designated as paratypes, but collected with the holotype, exist in the collections of CBB and WDS. Sixteen larvae and three pupae were also collected and are in the collections of CBB, WDS, and KLS. No additional specimens are known.

VARIATION (Table 1). All specimens in the type series are very similar. Pronotal MS and MC are obsolete in anterior 0.32-0.39. The pronotal OLD is shallow to deep. The length of tarsomere 5 varies from 0.03 mm shorter to 0.04 mm longer than the combined lengths of preceding four tarsomeres.

DIAGNOSIS. The uniquely shaped pronotum, which is widest near midlength and has narrow, deflexed, and divergent anterolateral angles, along with a densely pubescent, velvety appearance, is diagnostic. Adults are also easily recognized by their very tomentose elytra, and males by the shape of the penis.

ETYMOLOGY. Named in honor of Ira La Rivers for his extensive work on the fauna and flora of NV (Lugaski 1979).

DISTRIBUTION and ABUNDANCE. Presently this species is known only from the type locality. The population size is unknown, but it is probably relatively small; 116 adults were the most that were collected at one time.



Figs. 4-6. Male genitalia. 4. *Stenelmis lariversi*, n. sp., paratype. 5. *S. moapa* La Rivers. 6. *S. calida* Chandler, paratype. Scale bar = 0.25 mm.

HABITAT. Ash Springs is a series of warm springs (35.9° C) surrounding a man-made pool with a perennial outflow into a runoff stream (La Rivers 1948, Williams et al. 1985, Shepard 1993, C.B. Barr and W.D. Shepard, in litt.). C.B. Barr and W.D. Shepard collected the species in springheads around the pool's margin, with some adults as deep into the springhead as an arm could reach. Adults were not found in the pool's outflow stream despite extensive sampling, although *S. occidentalis* Schmude and Brown was found. R.S. Zack collected specimens from the same area, but about 50 m further away. He found adults only among small cobble and larger stones in a small riffle area that flowed from a pool. W.D. Shepard recently revisited Zack's site and found adults also inhabiting the springhead and submerged plants in still water areas. Several endangered or rare endemic desert fish, insects, and spring snails inhabit Ash Springs and nearby springs (Williams et al. 1985, C.B. Barr and W.D. Shepard, in litt.).

FLIGHT RECORDS. None, all specimens I examined were brachypterous.

STATUS. *Stenelmis lariversi* is likely endemic to warm springs in southern NV, and perhaps even to the type locality. Consequently, protection of the species and its habitat should be seriously considered.

Stenelmis moapa La Rivers, NEW STATUS

Stenelmis calida moapa La Rivers 1949:218. La Rivers 1950a:105, 1956:157, 1962:509; Brown 1972:20, 1983:10; Williams et al. 1985:47; U.S. Fish and Wildlife Service 1991:58828 (and as Moapa warm springs riffle beetle); Shepard 1992:380.

NEOTYPE MALE. The holotype of *S. moapa* is lost (see Remarks). **Head:** IOW 0.40 mm. Medial dark stripe narrowed posteriorly and narrower than each of the light stripes, which nearly cover entire area between eyes. Antennae and palpi testaceous.

Pronotum (Fig. 2): PL 1.11 mm, PW 0.94 mm. Lateral margins sinuate basally, convergent and bisinuate apically. MS relatively wide, widest anteriorly, narrowed basally. MC relatively low and narrow, most raised and narrowest posteriorly, slightly interrupted medially. MS and MC obsolete anterior 0.18 and posterior 0.10. OLD deep, clearly separating prominent lateral tubercles. PT nearly round, only barely longer than wide. PG medium size, not dense, uniformly distributed, and difficult to see. Color reddish gray. Surface covered with dense white tomentum and thin mineral deposit.

Elytra (Fig. 2): EL 2.34 mm, EW 1.16 mm. Discal costae moderately raised for 0.16 elytral length, broad, nearly reaching basal margin, which is raised between discal costae and anterior macula. Background color brown. Each elytron narrowly and faintly maculate; anterior macula confined to interval 5, longer than discal costa; posterior macula narrow anteriorly (interval 5), expanded posteriorly (striae 4-5), ending beyond lateral carina. Color pattern difficult to discern beneath tomentum, best seen when 95% ethanol is applied to surface (portion of white pubescence and mineral deposit scraped away medially). Lateral carina not sharply elevated; bowed inward medially. Fourteen scutellar granules, same size as PG.

Legs: FG numerous, moderately dense, and of two sizes, largest twice the size of smallest. Femora and tibiae reddish gray, tarsi testaceous. Mesotibial ridge low and elongate; metatibial

ridge very low and short. Tarsomere 5 much longer than combined lengths of preceding four tarsomeres; basal portion elongate (0.60 length), dilated next 0.17 length, uniformly wide apical 0.23.

Genitalia (Fig. 5): Penis widest in apical half, narrowed from base to midlength, widened in apical half with margins arcuate; lateral flange distinct and abruptly expanded with basolateral angle rounded and obtusely subangular, narrowed apically, and becoming flush with sides of penis before a line drawn between apices of parameres. Parameres with inner dorsal margins moderately divergent, apices obtusely rounded; outer margins slightly convergent from base to middle where they are briefly convex, then margins convergent to apices.

TYPE DATA. Neotype and 12 paratypes: "Warm Spgs. Nev. XII-26-27-1948 LaRivers - Banta"/ (blue) "PARATYPE Stenelmis calida moapa Ira LaRivers"/ (red) "NEOHOLOTYPE"/ (red) "STENELMIS MOAPA La Rivers det: K. Schmude" (male genitalia in microvial). Three additional paratypes have the following labels: "NEVADA: Clark Co., Warm Springs, Pelocoris Meadow 26-27 December 1948 I. LaRivers, BHBanta Cal. Acad. Sci. Coll."/ "IRA LA RIVERS COLLECTION Bequeathed to the CALIFORNIA ACADEMY of SCIENCES -1978"/ (brown) STENELMIS CALIDA MOAPA La Rivers 1949 TOPOTYPE"/ (yellow) "STENELMIS MOAPA La Rivers det: K. Schmude". The neotype and nine paratypes are in the SEMC where they originated, three paratypes are in the CASC, and two paratypes are in the author's collection.

ADDITIONAL SPECIMENS EXAMINED. NEVADA: Clark Co. W Glendale [or NW Moapa], Big Pool & outflow streams (8 CBB; 8 KLS; 51 WDS), Muddy River (1 CBB; 7 WDS), Warm Springs (36 AMNH; 5 CASC; 6 NCST; 85 NMNH; 14 WSUC; 56 KLS; 181 WDS).

VARIATION (Table 1). Variation within the type series is minimal. MS, MC, and lateral tubercles are more pronounced in some specimens. Elytra appear less maculate to immaculate due to different amounts of tomentum and mineral deposits. Lateral carinae on elytra are not as bowed inward medially on a few beetles.

DIAGNOSIS. Adults are most similar to those of *S. calida* Chandler, an endemic species that occurs in springs in the Death Valley National Park; the two are likely sister species. The pronotum of *S. moapa* is narrower and not hump-like in lateral view; the elytra are also narrower (Table 1). Tarsomere 5 is much longer than combined lengths of preceding four tarsomeres. Additional characters are discussed under *S. calida*. Adults of *S. occidentalis* occur with *S. moapa*, but the combination of narrower elytra, tomentose pronotum, long tarsomere 5, and male genitalia will separate adults of *S. moapa*.

DISTRIBUTION and ABUNDANCE. This species was previously known only from the type locality, Big Pool, and its outlet streams in the Warm Springs Area, which are part of the headwater sources of the Muddy (or Moapa) R.; the general area was described by La Rivers (1950b) and Williams et al. (1985). In 1986, W.D. Shepard and C.B. Barr found adults to be also abundant in Warm Springs (within Warm Springs Resort) south of Big Pool, and uncommon in the Muddy R. north of Big Pool. All other specimens I have examined were merely labeled from the general area. Apparently, *S. moapa* is endemic to the Warm

Springs Area, but see Remarks. As with *S. calida* and *S. lariversi*, the population size is unknown, with as many as 149 collected at one time at the Warm Springs site.

HABITAT. Big Pool is a warmwater (32° C), limestone spring, and its outlet streams become progressively cooler away from the source (24 -32 C); La Rivers (1949, 1950b,c) described the Pool and outlets. La Rivers (1949) found the majority of adults in the outlet streams only a few feet downstream from Big Pool where they occurred on gravel, vegetation, and particularly bare tree roots in the swift, shallow water. Specimens have also been collected on roots and algal covered rocks on a sand-gravel substrate in the nearby Warm Springs and Muddy River. Endangered or vulnerable endemic desert fish, insects, and springsnails occur with *S. moapa* (Williams et al. 1985, C.B. Barr and W.D. Shepard, in litt.).

REMARKS. After La Rivers' death, his insect collection (except Naucoridae) was donated to the Nevada State Department of Agriculture in Reno (Lugaski 1979). The transfer of insects from the Biology Department at the University of Nevada-Reno was made by then curator R.C. Bechtel (and others). I received a loan of La Rivers' collection of *Stenelmis*, but no adults of *S. moapa* were present, even though the holotype, paratypes and other specimens were stated to be "in the author's collection" (La Rivers 1949). Upon my request, R.C. Bechtel conducted a thorough, but unsuccessful, search through La Rivers' insect collection. Since the types of other species of insects described by La Rivers were present in the collection (R.C. Bechtel, pers. comm.), including a synoptic collection of *Stenelmis* that featured 40 paratypes of *S. calida* among other paratypes, I was mystified by the absence of *S. moapa*. Furthermore, paratypes were not present at the AMNH, NMNH, or the British Museum of Natural History, as stated by La Rivers (1949); the Paris Museum, also mentioned by La Rivers (1949), was not contacted. Fortunately, three specimens from the type series were sent to the CASC less than a year after La Rivers' death, which would suggest at least part of the series existed in 1978. Also, 13 paratypes were found in the SEMC, which were sent by La Rivers to M.W. Sanderson (M.W. Sanderson, in litt.). These 16 paratypes are the remains of what was likely a large type series, based on La Rivers' collecting habits. La Rivers probably kept at least some of his material in alcohol (La Rivers 1949:218, footnote), but no alcoholic material now exists in his collection (R.C. Bechtel, pers. comm.). Based upon this information, and upon the careful gathering of La Rivers' collection at the time of its transfer, R.C. Bechtel believes the remainder of the type series is lost, and I agree. To stabilize nomenclature among the growing number of species of *Stenelmis* found in southern Nevada, I designated a neotype from among the remaining 16 paratypes.

La Rivers (1949, 1950a) stated he found *S. moapa* at Ash Springs and in Hiko Spring in Lincoln Co., north of Warm Springs. These specimens (likely pre-

served in alcohol) have also disappeared, which is unfortunate because *S. moapa* has not been collected at Ash Springs, though *S. lariversi* and *S. occidentalis* have been found; I am unaware of any existing specimens of *Stenelmis* from Hiko Spring. It is also possible that some of La Rivers' type series of *S. moapa* included *S. occidentalis* since this species also occurs in the Warm Springs Area.

STATUS. This species is considered a federal species of concern, formerly designated as C2 (USFWS 1991).

Stenelmis calida Chandler

Stenelmis calida Chandler 1949:133, La Rivers 1949:220, 1956:157; 1962:509.

Stenelmis calida calida Chandler. La Rivers 1949:221, 1950a:105, 1956:157; Leech and Chandler 1956:361; Brown 1972:20, 1983:10; Williams et al. 1985:43; U.S. Fish and Wildlife Service 1991:58828.

Stenelmis calidae Chandler and *Stenelmis c. calidae* Chandler. Minckley and Deacon 1975:107, 108 (incorrect subsequent spellings).

Devil's Hole Warm Spring riffle beetle—Hershler and Sada 1987:841; U.S. Fish and Wildlife Service 1991:58828.

DIAGNOSIS. Because of its endemism, identification of *calida* can be based solely on its distribution. Adults are most similar to *moapa* but have a wider pronotum that appears humped in lateral view (Fig. 3). They also have wider elytra (Table 1), and the length of tarsomere 5 compared to the combined lengths of preceding four tarsomeres is much less. The penis is wider with the enlarged apical portion longer and wider; the lateral flange is more angular basolaterally (Fig. 6). Apices of the inner dorsal margins of the parameres are more sharply angled.

DISTRIBUTION and ABUNDANCE. Prior to Schmude (1992), verifiable records of *S. calida* were known only from Devil's Hole in Ash Meadows. The species is now known from the following nearby warm springs: Indian, Point of Rock, North and South Scruggs, Marsh, Bloody Gulch, and possibly Mexican (Schmude 1992, Shepard 1992, Shepard and Threlloff 1997). A series of adults was found in the NMNH with locality labels that read "NV:Mercury N.T.S." (Nevada Test Site). These beetles were collected during a study for the Atomic Energy Commission, but were apparently not collected in Mercury, NV; Mercury refers to the project name (P.J. Spangler, pers. comm.), and the exact site location is unknown. La Rivers (1962) reported that adults occurred at several places in addition to Devil's Hole, and he stated this species was a "common part of the fauna of hardscrabble creeks...in Ash Meadows," but adults he or others may have collected have not been located and probably do not exist anymore (see Remarks under *S. moapa*). The size of the population in Devil's Hole is unknown, but the largest known series is the type series, which consists of at least 131 specimens; La Rivers (1950a) stated this species "occurs in large numbers." In the other

Table 1. Variation of six mensural characters (mm) and their ratios for adults of *Stenelmis lariversi*, *S. calida*, and *S. moapa*. Measurements taken at 72X magnification. PL: pronotal length, PW: greatest pronotal width, EL: elytral length, EW: greatest elytral width, PE Length: summed individual lengths of pronotum and elytra, IOW: interocular width.

n	PL	PW	PW/PL	EL	EW	EL/EW	PE Length	IOW
<i>Stenelmis lariversi</i>								
♂ 40	0.83-1.06	0.68-0.89	0.77-0.89	1.68-2.23	0.84-1.08	1.96-2.23	2.51-3.29	0.31-0.40
♀ 40	0.84-1.10	0.73-0.95	0.81-0.89	1.75-2.23	0.85-1.05	1.95-2.23	2.59-3.31	0.33-0.40
<i>Stenelmis calida</i>								
♂ 70	1.01-1.28	0.94-1.26	0.86-0.99	2.13-2.63	1.16-1.48	1.71-1.96	3.14-3.88	0.40-0.49
♀ 78	1.04-1.25	0.94-1.18	0.87-0.96	2.18-2.60	1.13-1.43	1.76-2.00	3.24-3.85	0.39-0.50
<i>Stenelmis moapa</i>								
♂ 31	0.91-1.18	0.74-1.00	0.79-0.87	1.95-2.50	0.95-1.24	1.95-2.07	2.88-3.68	0.36-0.44
♀ 37	0.91-1.23	0.75-1.06	0.80-0.87	1.91-2.59	0.91-1.28	1.99-2.15	2.83-3.81	0.36-0.45

springs, many fewer adults were collected (maximum = 29, Indian Springs), mainly due to the fragile habitat (W.D. Shepard & R.S. Zack, pers. comm.). Sizes of the populations are assumed to be relatively small, but W.D. Shepard (in litt.) believes, "the populations are more abundant than previously suspected. However, due to the difficulty of working in the area, we have located only a few [populations]. But, the area is loaded with hard-to-find springs, many of them unnamed." W.D. Shepard (in litt.) is currently studying the ecology of *S. calida*.

HABITAT. Devil's Hole is a warm-water (32.8-33.9°C) pool within a limestone cavern that has been well described (Miller 1948, Chandler 1949, La Rivers 1950a, Dudley and Larson 1976, Williams et al. 1985, Hershler and Sada 1987). The beetles live among rocks on a shallowly submerged shelf, and apparently feed on the abundant algae. Water depths varied from a few inches to three feet (La Rivers 1950a), but due to groundwater pumping (Dudley and Larson 1976), recent depths varied from zero to several inches (W.D. Shepard, in litt.). The beetles share this habitat with the endemic and endangered (USFWS 1996) Devil's Hole pupfish, *Cyprinodon diabolis* Wales, which occasionally feeds on adults and larvae of the riffle beetle (Minckley and Deacon 1975). Adults from the other springs were collected in the outflow streams, which are extremely narrow and deeply incised into the desert floor (La Rivers 1953, Hershler and Sada 1987, Shepard 1992 and in litt.). Point of Rocks Springs was also described by La Rivers (1953); it harbors the federally endangered naucorid *Ambrysus amargosus* La Rivers (USFWS 1996).

SPECIMENS EXAMINED. NEVADA: Nye Bloody Gulch (2 KLS). Devil's Hole (65 CASC; 12 INHS; 5 LACM; 52 MCZC; 13 NMNH; 40 NSDA; 9 SEMC; 3 UCRC; 2 HPB; 6 KLS; 25 WDS). Indian Springs (6 KLS; 23 WDS). Marsh Spring (10 WSUC; 6 KLS). "Mercury" (see text; 46 NMNH; 5 KLS). North Scruggs Spring (11 WSUC; 10 KLS). Point of Rocks Springs (6 WDS). South Scruggs Spring (10 WSUC; 4 KLS).

STATUS. Unlike its neighbors, *Cyprinodon diabolis* and *Ambrysus amargosus*, *Stenelmis calida* is considered as a federal species of concern, formerly designated as C2 (USFWS 1991). Fortunately, the U.S. Fish and Wildlife Service manages Devil's Hole and the immediately surrounding land in Ash Meadows National Wildlife Refuge, which furnishes considerable protection for all its inhabitants.

Stenelmis occidentalis Schmude and Brown

Schmude and Brown (1991) described and illustrated this species, and provided measurements for specimens collected in southern Nevada. They also included comments on its diagnosis, distribution, abundance, and habitat.

Key to adults of *Stenelmis* in southern Nevada

1. Pronotum very pubescent, velvety in appearance, with anterolateral angles narrow, divergent, and deflexed; elytra very tomentose; penis without lateral flange; PE length 2.52-3.31 mm; Ash Springs *lariversi*
- Pronotum at most tomentose, not velvety in appearance, with anterolateral angles wider, most commonly subparallel, and not deflexed; elytra at most moderately tomentose; penis with or without lateral flange 2
2. Pronotum tomentose; tarsomere 5 elongate, 0.06-0.14 mm longer than combined lengths of preceding four tarsomeres; penis with lateral flange; PE length 2.83-3.81 mm; Warm Springs Area *moapa*
- Pronotum not tomentose; tarsomere 5 shorter, 0.04 mm shorter to 0.06 mm longer than combined lengths of preceding four tarsomeres; penis with or without a lateral flange 3
3. Anterior portion of pronotum appearing humped, deflexed; penis with lateral flange; PE length 3.14-3.88 mm; Devil's Hole and nearby springs *calida*
- Pronotum not noticeably deflexed or hump-like; penis without lateral flange; PE length 3.19-3.84 mm; Muddy R. and outflow streams of Warm and Ash Springs *occidentalis*

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